

notion; but the claim would have been a barren one.

One thing we miss in Maxwell's discussion—that is, the curious theorem of the splitting of the velocity of the particle describing the orbit into two constant components, one at right angles to the radius vector, and the other perpendicular to the major axis of the orbit. It is curious that there should be this relation.

A propos of the principle of least action, discussed in appendix ii., it is remarkable that if the major axis of an elliptic orbit, for a particle moving, as in the case of Nature, under a force along the radius vector from a focus, and varying as the square of the distance, is given, the action (the space-integral of the momentum round the orbit) is independent of the eccentricity of the orbit. It depends only on the major axis, so that it is the same for a circular orbit as for a long, narrow one. This gives a means of solving various problems.

Connected with this is another theorem that the kinetic energy of the particle at distance r from the same centre of force, in a hyperbolic orbit of semi-transverse axis a (equal to the semi-major axis of the elliptic orbit), exceeds, and in the elliptic orbit falls short of, the expansion $m\mu/r$ of potential energy, from infinity to the distance r , by the time or average of the kinetic energy of the elliptic motion.

One thing we cannot understand in the popular treatment of hodographic theory: Why is it always regarded as an affair of particle dynamics only? If we set up, or imagine set up, a sequence of vectors representing the angular momentum of a rigid body, say that of an aeroplane, the velocity of the extremity of the vector is in magnitude and direction the rate of change of the angular momentum. This might help to prevent that pernicious "ignorance" of the direction of the angular momentum vector, and its variation, which characterises so many uninstructed but apparently influential people. A. GRAY.

A Socialist Commonwealth.

A Constitution for the Socialist Commonwealth of Great Britain. By Sidney and Beatrice Webb. Pp. xviii+364. (London: Longmans, Green, and Co., 1920.) 12s. 6d. net.

IN this volume Mr. and Mrs. Webb set themselves to build "an efficiently working, genuinely democratic constitution" out of the materials that are already to hand. The distinctive feature of the Socialist Commonwealth of Great Britain will be the division of the labours of our present overworked Parliament between two NO. 2682, VOL. 107]

co-equal bodies, the Social and the Political Parliaments, both elected on a geographical basis by all the adult citizens. The Political Parliament will deal mainly with defence, justice, and foreign affairs, and will have a keen eye to the protection of the liberty of the individual. To the Social Parliament all else falls—labour, health, education, the control of industry, and care for the interests of generations yet unborn. In the hands of the Social Parliament rests also the power of the purse; from which it may be anticipated that the Political Parliament, for all its nominal equality, will have to mind its "p's and q's."

Perhaps the most fruitful part of a very suggestive work is contained in the proposals for the reconstruction of local government. On this the authors speak with ripe experience of actual administration, as well as with their usual wide theoretical knowledge. The unit of local government is to be the ward, though different wards are to be grouped and re-grouped in such a way as to give a unit of appropriate size for the conduct of each municipalised service. Economic efficiency will thus no longer be subservient to the historical accident of municipal boundaries.

Industry will of course be "socialised." Socialisation will take a variety of forms, the common features of which will be production for use and not for profit, and the separation of control from actual administration. Nationalisation, municipalisation (of which a great expansion is anticipated), and organisation on the co-operative principle exhibited by the existing Consumers' Co-operative Movement will be the three great types. The nationalised industries will be administered by a hierarchy of national boards, regional councils, and works or pit committees, responsible to a Standing Committee of the Social Parliament, and goaded into efficiency by the supervision and control of an independent department. Bureaucracy is anathema. A limited share in administration will be accorded to the appropriate organisations of workers, although Mr. and Mrs. Webb believe in the conduct of industry by the community for the community, rather than by the workers for the workers. The charwomen who clean the schools are not to dictate what shall be taught there. Vocational organisations, of the form of our present trade unions and professional associations, will be concerned rather with the protection of the status of the several vocations, the promotion of all kinds of scientific research (on which the authors lay great stress), and the maintenance of professional honour. For a national body elected on a vocational basis, such as a regenerated Trade Union Congress, the authors

see little future in their commonwealth. It may be suggested that in taking this view they are rejecting a method of "functional devolution" likely to be more effective than the Parliamentary dualism which receives their blessing.

The book is interesting, but not light reading. Some of its proposals will no doubt appeal to all readers; all of its proposals to some readers. Universal acceptance *in toto* is, of course, not to be expected. But criticism is easy; construction as difficult as it is urgent. This constitution-making commands the respect of the critic for its concrete and practical character.

BARBARA WOOTTON.

Science for the Young Farmer.

The Chemistry of Crop Production. By Prof. T. B. Wood. Pp. vii+193. (London: W. B. Clive, 1920.) 5s. 6d.

PROBABLY no one in the country is better equipped for the task of writing an elementary book for the young farmer than Prof. Wood. He has had a long teaching experience at Cambridge, and has himself run a farm at a profit; in addition, he has carried out important scientific investigations in agriculture, and was responsible during the war for studying fully the national food supply.

With this equipment on the part of the author, it is not surprising that his little book itself is admirable. It is lucidly written, and gives the student the facts he wants, expressed in language which, if lacking the picturesqueness of the author's daily use, is nevertheless much more vivid than is customary in a student's text-book. At the outset the complexity of the problem is realised, and it is emphasised that soil fertility depends not on one, but on many independent factors, any of which may prove insufficient and set a limit to plant growth. These factors are then studied one by one. Considerable information is given about soil types and the method of characterisation by mechanical analysis; examples are drawn from the surveys of Norfolk by Newman, and of Kent, Surrey, and Sussex by Hall and Russell. Several maps show the distribution of crops in the eastern counties, and illustrate the intense localisation of potatoes and the much wider distribution of wheat. Water supply is discussed in relation to rainfall, and a section on weather and meteorology will give the student much information of interest to him.

The principles of manuring are clearly set forth with many examples which will prove of value to the student. Throughout, considerable stress is

laid on the economic side, prices and probable returns being freely quoted. In future editions it will be well to substitute a paragraph on the basic open-hearth for the present one on the Bessemer process, which is now largely superseded. The catalytic process for preparing ammonia synthetically will also probably deserve mention along with the method for making calcium nitrate and cyanamide from the air.

The last chapter contains an interesting summary of the leading features of British agriculture, showing how greatly grass predominates. This is shown to be connected with the high rainfall and high altitude of much of the country, though it is also influenced by considerations of capital and labour. Of the other crops, most are grown for animals, 63,000,000 tons (including 50,000,000 of grass) being produced for them, as against 1,900,000 tons for human consumption, and 1,400,000 for industries, all reckoned as dry matter. The 63,000,000 tons become 54,000,000 when deduction is made for the horses, and it is shown that the whole of this 54,000,000 tons, *plus* another 8,000,000 tons of imported produce, is taken by animals which will be eaten by human beings; but it yields only $1\frac{1}{2}$ million tons of human food, again expressed as dry matter. The animal as at present managed is not a very efficient converter.

E. J. R.

A Fabre Anthology.

Insect Adventures. By J. H. Fabre. Pp. xii+308. (London: Hodder and Stoughton, Ltd., n.d.) 8s. 6d. net.

IT was a happy thought to adapt for young people, as Miss Louise S. Hasbrouck has done, some of the translations made by Mr. Teixeira de Mattos from Fabre's "*Souvenirs Entomologiques*." Fabre's studies of animal behaviour appeal to children more organically than any premature analysis, and the great naturalist had a way with him that attracted young folks. Reproaching the anatomical zoologists, he wrote: "You pry into death, I pry into life . . . I write above all for the young. I want to make them love the natural history which you make them hate; and that is why, while keeping strictly to the domain of truth, I avoid your scientific prose, which too often, alas! seems borrowed from some Iroquois idiom." So we have these delightful stories of ants, bees, wasps, flies, beetles, moths, caterpillars, and spiders. There is poetry in the picture of his first pond, with its diamonds and gold dust and "heavenly" beetles, which had all to be cast on the rubbish heap when the boy got